

## **REMARKS**

### **Status of the Claims**

Claims 1-21 were canceled. Claims 22-43 were previously presented and are under consideration. Claim 38 is allowed. Claims 23, 30-36 and 40-43 are merely objected to.

Claims 22 and 24 are herewith amended for greater clarity by simply listing the various rotation and pivot axis.

Claim 23 is amended to independent form. Indication of allowance is respectfully requested.

Claim 25 is amended based on paragraph [0010] of the specification as filed to further emphasize that the energy projected by the directional loudspeaker remains unidirectional after reflection. Support for the amendment of claim 25 can be found in paragraph [0010] of the specification as filed, as discussed below.

Support for the amendment of claim 26 can be found in paragraph [0023] of the specification as filed.

### **Claim Rejections - 35 USC § 102**

Claim 25 is rejected under 35 U.S.C. §102(b) as being anticipated by Kinya (Matsuzawa) Japanese Patent Publication 2005073126A.

Applicants respectfully traverse, particularly in view of the further clarification of claim 25.

Claim 25, as amended for clarity, concerns a directional loudspeaker with a single pivotable reflector being provided for deflecting the directional sound about a first, pivot axis while maintaining directionality of the sound, wherein the reflector is connected to and mounted on the wall of the housing such that it can be moved along the top of the wall wherein the reflector is connected to and mounted on the wall of the housing such that it can be moved along the top of the wall to rotate the direction of the sound about a second, rotation axis while maintaining directionality of the sound.

Support for the amendment of claim 26 can be found in paragraph [0010] of the specification as filed, and Figs. 1 and 2, i.e., "the reflector ... serves to deflect the energy coming from the directional loudspeaker's sound source into a prescribable, desired direction

through suitable orientation, ....". The first pivot axis and the second [rotation] axis are shown in Fig. 1.

Further, although claim 23 is not rejected under this paragraph Applicants point out that claim 23 has been amended to claim the housing in which the sound source is installed has an essentially circular cross section, and wherein the reflector is moveably connected to the housing by a pivot joint on a raceway which is seated on the housing for rotating the reflector about an axis of rotation along the top edge of the reflector.

Turning to Kinya, according to the Examiner Kinya discloses a directional loudspeaker, comprising a sound source for producing highly directional sound which is formed by at least one ultrasound loudspeaker (1), a pivotable reflector (20A, 20B) being provided for deflecting the directional sound, wherein the at least one ultrasound loudspeaker is located in a housing (30), wherein the reflector is connected to the housing, and wherein the reflector is connected to and mounted on the wall of the housing so that it can be moved along the top of the wall (See Figs 1-3 and abstract translation, louvers 20B are movable along the top wall of housing 30 by angle adjustment knob 27B).

In response, Applicants submit that Kinya does not teach a reflector, but rather, a "plurality of louvers 20A, 20B" controllable with a number of adjustment knobs 27A, 27B for moveable to separately control horizontal and vertical direction, and to allow the sound to converge or diffuse the reproduced sounds.

Accordingly, the reflector of the present invention differs from Kinya in that it is

- a single reflector,
- pivotable for deflecting the directional sound about a pivot axis,
- while maintaining directionality of the sound, and also
- connected to and mounted on the wall of the housing such that it can be moved along the top of the wall to rotate the direction of the sound about a rotation axis
- while maintaining directionality of the sound.

Withdrawal of the rejection is respectfully requested.

### **Claim Rejections - 35 USC § 103**

Claims 22, 24, 26 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kinya in view of Fillery GB Patent Specification I 463 802.

**Claim 22**

According to the Examiner, regarding claim 22, Kinya discloses a directional loudspeaker, comprising a sound source for producing highly directional sound which is formed by at least one ultrasound loudspeaker (1), a pivotable reflector (20A, 20B) being provided for deflecting the directional sound, wherein the at least one ultrasound loudspeaker is located in a housing (30), wherein the reflector is connected to the housing (see Figs 1-3 and abstract translation). Kinya does not expressly disclose the housing is mounted on a support so as to be able to pivot and tilt relative to said support. However, the use of pivotable supports for speakers is well known in the art and Fillery teaches a pivotable support for mounting to a loudspeaker to allow the loudspeaker to be pivoted about any axis (See Figs. 1-3). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to allow the speaker housing to be pivotable about an axis so that, in use, the mounted speaker can be adjusted relative to the support (See lines 19-33).

Applicants respectfully traverse.

The loudspeaker mounting of Fillery can orient a loudspeaker in “a single axis or two perpendicular axis”. Since such a loudspeaker can be “aimed” in any direction, there is no need to further modify a loudspeaker, mounted on the mounting of Fillery, for any reason, much less by addition of a reflector to deflect sound.

Further, since the loudspeaker of Fillery is a conventional loudspeaker, Fillery does not experience problems associated with unidirectional loudspeakers, and in particular the physics of deflection of sound from a unidirectional speaker.

Turning to Kinya, since the speaker of Kinya is provided with two sets of louvers, one set for deflecting sound in the horizontal direction and one set for deflecting sound in the vertical direction, there is no need to provide the speaker of Kinya on a mount.

Further yet, the speaker of Kinya is not a speaker with a reflector, thus there is no need to mount the speaker so that movement of the speaker can compensate for limited range of deflection provided by a reflector according to claim 22.

Accordingly, the references, read by themselves, provide no motivation for combination, much less for solving the problem addressed by the present invention.

Claim 22 is directed to a directional loudspeaker, with at least one ultrasound loudspeaker as a highly directional sound source, and a pivotable reflector for deflecting the

directional sound.

As explained in paragraph [0031], the reflector is most effective at an angle of 45° in the sense that the reflector area (54) reflects the sound from the array completely. An angle of greater than 45° requires a larger reflector, and an angle of less than 45° results in partial coverage of the reflection by the base area. The present invention addresses this problem: how can a large section of the environment be targeted if the of the reflector loses effectiveness of the reflection angle is greater or less than the optimal angle?

As explained in paragraph [0011] of the application as filed, in the preferred arrangement as claimed in claim 22 the directional loudspeaker housing itself is not mounted solidly on a support but rather the housing is mounted on a support so as to be able to pivot and tilt relative to said support. Assuming that the orientation of the reflector with respect to the sound source remains the same (e.g., at the optimal angle of 45°), it becomes possible, by pivoting and/or tilting the housing, to pivot the entire arrangement including the reflector and the sound source. When “aiming” is done by changing the relationship between housing and base, the reflector is free to maintain the optimal reflection angle to the speaker. This allows the spatial area to which sound can be sent directly by means of the directional loudspeaker to be extended significantly (claim 22), and allows optimal reflection.

Kinya in contrast addresses the “problem” of the sharp directivity of sound emissions from an ultrasound source, which sharp directivity may not be suitable for use in, e.g., home entertainment. Kinya shows sets of louvers for vertical directing of sound, and additional sets of louvers for vertical direction of sound, by way of which reproduced sounds can be converged or diffused in accordance with the situation of listening. This is far from the present invention.

Accordingly, while the present invention provides an improved way to maintain directivity yet be able to aim over a greater area (azimuth), Kinya does not maintain directionality. While the present claims require the housing to be tilted relative to the base, or inner housing to be tilted relative to the outer housing, so that the reflector and speaker arrangement can target a broader area with good reflectivity, Kinya has no such teaching. In Kinya only the louvers are moved (with knobs 27A, 27B), never the speaker or speaker housing. The housings shown in the figures are mere flat boxes, with no means provided for tilting up or down.

There being no suggestion of the problem addressed by the present invention, or the unique solution to the problem as claimed in claim 22, and there being no motivation to combine the references other than hindsight, it is respectfully requested that the rejection of claim 22 be withdrawn.

**Claim 24**

Regarding claim 24 (speaker mounted to rotate about first rotation axis and pivot about first pivot axis, and reflector mounted to rotate about second rotation axis and pivot about second pivot axis), according to the Examiner the combination of Kinya in view of Finnery further discloses the reflector is connected to and mounted on the wall of the housing such that it can be moved along the top of the wall (See Kinya Fig. 3, louvers 20B are movable along the top wall of housing 30 by angle adjustment knob 27B).

In response, Applicants amend claims 22 and 24 to clarify that the speaker housing and the reflector of the embodiment claimed in claim 24 are mounted to rotate about a first and a second rotation axis and to pivot about a first and a second pivot axis. Kinya has one set of louvers able to pivot about a first pivot axis, and a different set of louvers able to pivot about a second pivot axis. The louvers of Kinya are designed to diffuse sound, not maintain directionality. This is apparent from the central opening between the left and right set of louvers and the upper and lower sets of louvers in Fig. 3 of Kinya.

There is no teaching in Kinya or Finnery of any reason why a speaker and reflector should be mounted to rotate about a first and a second rotation axis and to pivot about a first and a second pivot axis.

Withdrawal of the rejection is respectfully requested.

**Claim 26**

Regarding claim 26, the combination of Kinya in view of Finnery further discloses the reflector is moveably connected to the housing by a joint (200A and 200B) (See Fig. 3).

In response, Applicants point out that claim 26 has been amended to recite that the housing in which the sound source is installed has an essentially circular cross section, and wherein the reflector is moveably connected to the housing by a pivot joint on a raceway which is seated on the housing for rotating the reflector about an axis of rotation along the top edge of the reflector.

The benefits of this design have been discussed above.

Withdrawal of the rejection is respectfully requested.

**Claim 37**

Regarding claim 37, according to the Examiner Kinya discloses a method for operating a directional loudspeaker, comprising: emitting highly directional sound from a sound source via at least one ultrasound loudspeaker (1), and deflecting the emitted sound by means of a reflector swivel-mounted on the housing (20A, 20B) (See Figs 1-3 and abstract translation). Kinya does not expressly disclose the directional orientation of the sound the housing includes a base and is tilted or pivoted relative to the base of the housing or, in the case that the housing is comprised of an inner part on which the reflector is mounted and a supplemental housing outer part, the inner part of the housing with which the reflector is connected is tilted or pivoted relative to the supplemental housing outer part. However, the use of pivotable supports for speakers is well known in the art and Finnery teaches pivotable support for mounting to a loudspeaker to allow the loudspeaker to be pivoted about any axis (See Figs. 1-3). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to allow the speaker housing to be pivotable about an axis so that, in use, the mounted speaker can be adjusted relative to the support (See lines 19-33).

Applicants respectfully traverse.

Claim 37 concerns a method for operating a directional loudspeaker, comprising emitting highly directional sound from a sound source via at least one ultrasound loudspeaker, and deflecting the emitted sound by means of a reflector swivel-mounted on the housing, wherein for the directional orientation of the sound the housing includes a base and is tilted or pivoted relative to the base of the housing or, in the case that the housing is comprised of an inner part on which the reflector is mounted and a supplemental housing outer part, the inner part of the housing with which the reflector is connected is tilted or pivoted relative to the supplemental housing outer part.

Applicants respectfully point out that, as discussed above, a reflector has only a limited angle and range of optimal effectiveness, i.e., about  $45^{\circ} \pm 10^{\circ}$ . Kinya does not teach how to overcome this limited range of directability of the ultrasound energy. Those working in this art would not look to the loudspeaker mount of Finnery to find a solution to the ultrasound projection art. Nowhere is there teaching of (a) the reflector but also (b) the

housing mounted for tilting/pivoting, whereby the reflector can be tilted to an optimal effectiveness relative to the speakers, and wherein the speaker-reflector unit can be pivoted and tilted for directing the directional energy to cover a wide range and azimuth.

Claim 37, as amended for clarity, is directed to a method for operating a directional loudspeaker, wherein, for the directional orientation of the sound, not only is the reflector used to deflect sound, but

- the housing includes a base and is tilted or pivoted relative to the base or,
- in the case that the housing is comprised of an inner part on which the reflector is mounted and a supplemental housing outer part, the inner part of the housing with which the reflector is connected is tilted or pivoted relative to the supplemental housing outer part.

The aiming of the sound is thus a result of the combined action of (a) the reflector and (b) the base. For the same reasons as discussed with respect to claim 25, this allows the spatial area to which sound can be sent directly by means of the directional loudspeaker to be extended significantly, with optimal degree of reflection.

There being no teaching in Kenya relevant to the present invention as claimed in claim 37, withdrawal of the rejection is respectfully requested.

**Claims 27-29 and 39**

Claims 27-29 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kinya in view of Finnery in further view of Lin U.S. Patent No. 5,914,700. (Patent 5,914,700 (Tonosaki) is directed to an image display apparatus for displaying an image. Applicants presume the Examiner intended to cite 5,194,700.)

Regarding claim 27 (wall of the housing has a circular cross-section), this circularity allows the reflector to be moveably connected to the housing by, e.g., a pivot joint on a raceway which is seated on the housing, for rotating the reflector about an axis of rotation along the top edge of the reflector. Obviously, if the top of the housing was square, the rotation of the reflector would not be so simple.

Regarding claim 28, wherein the reflector is pivoted such that it serves as mechanical protection for the directional loudspeaker's sound source, Lin may teach a plurality of louvers that can be closed to cover the loudspeaker, but Lin does not teach a single reflector that

accomplishes both reflection – particularly of an ultrasound source – and covering.

Regarding claims 29 and 39 (the housing, in which the ultrasound loudspeaker is situated, can be sealed by the reflector), this embodiment is patentable for the same reasons as claim 28.

**Allowable Subject Matter**

Claim 38 is allowed.

Claims 23, 30-36 and 40-43 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent claim including all of the limitations of the base claim and any intervening claims.

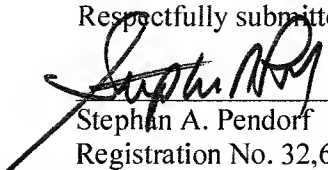
In response, claim 23 is amended to independent form. The remaining claims are believed patentable by virtue of their dependency from allowable base claims.

The Commissioner is hereby authorized to charge any fees which may be required at any time during the prosecution of this application without specific authorization, or credit any overpayment, to Deposit Account Number 16-0877.

**Should further issues remain prior to allowance, the Examiner is respectfully requested to contact the undersigned at the indicated telephone number.**

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Respectfully submitted,



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